Bombardment of Atomically-Thin Photosensors from Two Sides Using Bypass and Light-Slowing Prisms for Enhanced Detection of Light

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Introduction

Traditional photosensors such as CMOS sensors have always operated according to the principle of light being permitted through a lens before striking a single side of a thin photosensor.

As a practical matter, it is easier to make the photosensors thinner than it is to make the sensor nodes more granular. Although further-miniaturized nodes would result in an increase in resolution, if extant sensors were made to be just slightly thinner than is currently typical in the optics industry, it would become practical to improve sensor resolution in a non-traditional manner not heretofore tried.

Abstract

Provided a sensor of atomic or near-atomic thickness, it should be feasible to redirect half of the light captured by a camera around to the rear of the sensor. As the light would have to travel a greater distance to arrive there, the light meant to strike the forward-facing side of the sensor would have to be proportionally slowed in order to ensure that captured the light is phase-synchronized. Multiple sets of mirrors would have to be kept in perfect alignment in order to ensure that light describing the contents of a particular portion of the field of view strikes the same sensor node and any misalignment would result in blurring.

When light is captured by a traditional photosensor, like in an photovoltaic process, the chances of the light being converted into a useful signal depend upon photon-to-electron conversion, which is probabilistic and depends upon the presence of a localized zone of positive charge being present in the same spatial area within the electron cloud of the specific atoms affected. If atomically-thin or mono-atomic sensors were utilized and if the light were divided so that half would strike the front and half would strike the rear, it would increase the probability of photon-to-electron conversion, thereby making the sensor more efficient.

Conclusion

This change in design would require that data output from the sensor be conveyed to the processor through ports around the perimeter of the sensor rather than affixed to to the rear, naturally. Given that resolution should be approximately doubled through this approach, a redesign of the signal pathways could be justified. This approach may be coupled with other innovations in order to provide further enhancement to effective resolution.